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EXAMINER	
FEELY, MICHAEL J	

ART UNIT	PAPER NUMBER
1712	

DATE MAILED: 02/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/036,724	DASHIELL, DAVID M.	
	Examiner	Art Unit	
	Michael J Feely	1712	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 November 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11 and 13-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *18-34,37 and 38* is/are allowed.

6)☒ Claim(s) *1-11,13-17,35 and 36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 February 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Pending Claims

1. Clams 1-11 and 13-38 are pending.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. The rejection of claims 1, 2, 4, 7, 11, 14, 16, 19, 21, 23, 25, 27, 29, 31, 34, and 36 has been overcome by amendment.

Claim Rejections - 35 USC § 102/103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. The rejection of claims 1-5, 8-11, 16-17, and 35-36 under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Lorenz et al. (US Pat. No. 6,149,747) and the following technical bulletins: Epon Resins and Modifiers, Physical Properties Guide for Epoxy Resins and Related Products (provided by Resolution Performance Products), and Product Data for Araldite® GT 7013 (provided by Jubail Chemical Industries Company), ***stands for the reasons of record***:

Normally, only one reference should be used in making a rejection under 35 U.S.C. 102; however, a 35 U.S.C. 102 rejection over multiple references has been held to be proper when the extra references are cited to: (A) prove the primary reference contains an "enabled disclosure;" (B) explain the meaning of a term used in the primary reference; or (C) show that a characteristic not disclosed in the reference is inherent *(see MPEP 2131.01)*. In the instant case, the technical

bulletins are used to show that certain physical properties, namely melting point and softening point, are inherent in the cited epoxy resins and epoxy curing agents of Lorenz et al.

Regarding claims 1, 2, 4, and 16, Lorenz et al. disclose:

(1) and aqueous coating formulation ('747: column 7, lines 62-65) which forms a thermal transfer layer of a thermal transfer medium ('747: column 8, lines 34-39), said thermal transfer layer having a softening point below 200°C ('747: column 8, lines 65-67), said coating formulation comprising:

an aqueous emulsion ('747: column 7, lines 62-65) of at least one thermoplastic resin and/or wax ('747: column 5, line 49 through column 6, line 7) and at least one epoxy curing agent which initiates crosslinking with an epoxy resin ('747: column 6, lines 36-60), and wherein said epoxy curing agent is co-emulsified with said at least one thermoplastic and/or wax ('747: column 7, lines 62-65),

wherein said aqueous emulsion comprises and aqueous liquid which does not solubilize the epoxy curing agents, thermoplastic resins or waxes ('747: column 7, lines 62-65), and wherein the epoxy curing agents ('747: column 6, lines 36-60;), thermoplastic resins, and waxes ('747: column 5, lines 65-67) each have a softening point below 200°C (Physical Properties Guide or Epoxy Resins and Related Products *see Epi-Cure® P-101: page 26*), the thermoplastic resin and waxes are solid at 20°C ('747: column 5, lines 65-67), and the epoxy curing agent is either solid at 20°C or encapsulated in a wax or thermoplastic reins which is solid at 20°C (Physical Properties Guide or Epoxy Resins and Related Products *see Epi-Cure® P-101: page 26*);

(2) which additionally comprises an aqueous dispersion ('747: column 6, lines 62-65) of at least one epoxy resin ('747: column 6, lines 36-60) which is solid at 20°C and has a softening point below 200°C (Epon Resins and Modifiers *see Epon Resin 164: page 12*; and Product Data for Araldite® GT 7013) so as to melt mix with the epoxy curing agent at a temperature in the range of 50°C to 250°C ('747: column 8, lines 65-67);

(4) which additionally comprises a sensible material dispersed therein ('747: column 5, lines 39-48); and

(16) wherein the epoxy curing agent is selected from the group consisting of polyamines, polymercaptans, dicyandiamides, carboxylic acid functionalized polyesters, phenol-formaldehyde resins and amine-formaldehyde resin ('747: column 6, lines 50-54).

Lorenz et al. do not explicitly disclose that the wax has a softening point below 200°C; however, they disclose that the melting point of the wax is preferably form 60°C to 150°C (column 5, lines 65-67). A wax having a melting point within this range would inherently have a softening point below 200°C.

Regarding claims 3, 5, 8, and 17, Lorenz et al. disclose:

(3) an aqueous coating formulation ('747: column 7, lines 62-65) which forms a thermal transfer layer of a thermal transfer medium ('747: column 8, lines 34-39), said thermal transfer layer having a softening point below 200°C ('747: column 8, lines 65-67), said coating formulation comprising a combination of:

a) an aqueous emulsion ('747: column 7, lines 62-65) of at least on thermoplastic resin and/or wax ('747: column 5, line 49 through column 6, line 7) co-emulsified with at least one

epoxy curing agent which initiates crosslinking with an epoxy resin ('747: column 6, lines 36-60) and

b) an aqueous dispersion of at least one epoxy resin ('747: column 6, lines 36-60), said aqueous coating formulation comprising an aqueous liquid which does not solubilize epoxy curing agents, thermoplastic resins, waxes, or the epoxy resins ('747: column 7, lines 62-65),

wherein each of the epoxy resins ('747: column 6, lines 36-60), epoxy curing agents ('747: column 6, lines 36-60), thermoplastic resin, and waxes ('747: column 5, lines 65-67) have a softening point below 200°C (Physical Properties Guide or Epoxy Resins and Related Products *see Epi-Cure® P-101: page 26*; Epon Resins and Modifiers *see Epon Resin 164: page 12*; and Product Data for Araldite® GT 7013), wherein each of the epoxy resins ('747: column 6, lines 36-60), thermoplastic resin, and waxes ('747: column 5, lines 65-67) are solid at 20°C (Epon Resins and Modifiers *see Epon Resin 164: page 12*; and Product Data for Araldite® GT 7013), and each of the epoxy curing agents are either solid at 20°C or encapsulated in a thermoplastic resin or wax which is solid at 20°C (Physical Properties Guide or Epoxy Resins and Related Products *see Epi-Cure® P-101: page 26*);

(5) which additionally comprises a sensible material dispersed therein ('747: column 5, lines 39-48);

(8) wherein the epoxy resin is diglycidyl ether bisphenol A ('747: column 6, lines 45-48; and Product Data for Araldite® GT 7013) and the epoxy curing agent is a polyamine ('747: column 6, lines 50-54); and

(17) wherein the epoxy curing agent is selected from the group consisting of polyamines, polymercaptans, dicyandiamides, carboxylic acid functionalized polyesters, phenol-formaldehyde resins and amine-formaldehyde resin ('747: column 6, lines 50-54).

Lorenz et al. do not explicitly disclose that the wax has a softening point below 200°C; however, they disclose that the melting point of the wax is preferably form 60°C to 150°C (column 5, lines 65-67). A wax having a melting point within this range would inherently have a softening point below 200°C.

Regarding claims 9-11, Lorenz et al. disclose that epoxy curing agents are heat-activated ('747: column 6, lines 48-50); however, they do not explicitly disclose that epoxy curing agent is activated to initiate crosslinking with an epoxy resin at temperatures in the range of 60°C-100°C, and that the epoxy curing agent remains active at 20°C after activation. It appears that these reactive properties would be material-specific. It has been found that if the prior art teaches the identical chemical structure, then the properties applicant discloses and/or claims are necessarily present – *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). Because Lorenz et al. satisfy the physical limitations of the epoxy curing agent, these properties would have been inherent in the epoxy curing agents used by Lorenz et al.

Regarding claims 35 and 36, Lorenz et al. are as set forth above and incorporated herein. Lorenz et al. teach a thermal transfer medium comprising all of the chemical components set forth in claims 18 and 19 (and claims 1 and 3); however, they are silent regarding the specific orientation and structure of the thermal transfer medium. Claims 35 and 36 are product by process claims drawn to printed matter made by the thermal transfer media of claims 18 and 19. Although Lorenz et al. do not teach the exact medium, the chemical make-up of the media of

claims 18 and 19 is identical to the chemical make-up of the thermal transfer media taught by Lorenz et al. It has been found that, "Even though product-by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same or obvious from a product of the prior art, the claim is unpatentable even though the prior art product was made by a different process." – *In re Thorpe,* 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). The product of the instant invention is made with same chemical components used in Lorenz et al.; therefore, it would have been the same or an obvious variation of the prior art.

Therefore, if not explicitly disclosed in the reference, then the teaching would have been obvious to one of ordinary skill in the art at the time of the invention.

Claim Rejections - 35 USC § 103

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

The rejection of claims 6, 7, and 13-15 under 35 U.S.C. 103(a) as being unpatentable over Lorenz et al. (US Pat. No. 6,149,747) and the following technical bulletins: Epon Resins and Modifiers, Physical Properties Guide for Epoxy Resins and Related Products (provided by Resolution Performance Products), and Product Data for Araldite® GT 7013 (provided by Jubail Chemical Industries Company), ***stands for the reasons of record:***

Regarding claims 6 and 7, Lorenz et al. disclose the compositions of claims 2 and 3, which comprise from 5-50 wt% solids ('747: column 8, lines 9-13), of which 5 to 15 wt% comprises thermoplastic resin and/or wax ('747: column 8, lines 14-19), and 30-65 wt%

comprises epoxy resin ('747: column 8, lines 14-19). Lorenz et al. are silent regarding the epoxy curing agent concentration of 2 to 25 wt%; however, Applicant fails to show criticality for this range.

Concentration of curing agent in epoxy systems is a result effective variable because too low of a concentration fails to yield and adequately cured product, and too high of a concentration, in excess of the stoichiometric requirement, fails to be cost-effective. It has been found that, "where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover optimum or workable ranges by routine experimentation," – *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955) and *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claims 14 and 15, Lorenz et al. fail to disclose the composition of claim 1 comprising more than one epoxy curing agent and the composition of claim 3 comprising more than one epoxy resin or more than one epoxy curing agent.

Lorenz et al. disclose the use of various epoxy resin and various epoxy curing agent ('747: column 6, lines 36-60), all of which meet the melting and softening point limitations set forth in claims 1 and 3. Each of these epoxy resins and epoxy curing agent represent separate embodiments of the prior art, for the common purpose of forming a thermal transfer medium. It has been found that, "It is *prima facie* obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose…The idea of combining them flows logically from their having been individually taught in the prior art." – *In re Kerkhoven*, 626 F.2d 846, 850, 205

USPQ 1069, 1072 (CCPA 1980). The addition of a second epoxy resin or second epoxy curing agent would have been the equivalent of combining two known embodiments of the prior art.

Allowable Subject Matter

7. Claims 18-34, 37, and 38 are allowed.

8. The following is an examiner's statement of reasons for allowance:

Claims 18-34 are allowed *for the reasons of record:*

Regarding claims 18, the prior art fails to teach or suggest a thermal transfer medium having a softening point below 200°C, comprising a substrate and a single thermal transfer layer made from the composition of claim 3, wherein the epoxy curing agent is *dispersed within* the at least one thermoplastic resin and/or wax *and separated* from said epoxy resins so as to not react without melt mixing. Lorenz et al. are silent regarding the epoxy curing agent being *dispersed within* the thermoplastic resin and/or wax. Furthermore, they teach away from the concept of separating the wax/or thermoplastic resin from the epoxy resin ('747: column 7, lines 13-21).

Claims 20, 22, 24, 26, 28, 30, 32, and 33 are allowable because they are dependent upon claim 18.

Regarding claim 19, the prior art fails to teach or suggest a thermal transfer medium having a softening point below 200°C, comprising a substrate and a two layer thermal transfer material, wherein the first layer comprises an epoxy resin, and the second layer is formed from the composition of claim 1. The prior art is silent regarding this three-layer (including the substrate) system, wherein epoxy curing agent is *dispersed within* the thermoplastic resin and/or wax and isolated from a separate epoxy resin-containing layer.

Claims 21, 23, 25, 27, 29, 31, and 34 are allowable because they are dependent upon claim 19.

New claims 37 and 38 are allowed for the reasons set forth above in claims 18 and 19. In the embodiments of claims 37 and 38, the epoxy curing agent is *dispersed within* the thermoplastic resin and/or wax. Lorenz et al. is the closest prior art; however, they fail to teach or suggest these embodiments of the instant invention.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

9. Applicant's arguments filed November 19, 2003 have been fully considered but they are not persuasive. Applicant have presented similar arguments to those presented in the response filed July 14, 2003:

1) Lorenz et al. disclose a formulation including a wax, a binder resin (epoxy), two or more resins, and a crosslinker, wherein this formulation can exist as an aqueous or organic solution, dispersion or emulsion. However, it fails to teach or suggest that the curing agent is in a co-emulsion (or co-dispersion) with a thermoplastic resin and/or wax, and an aqueous liquid;

2) There is no indication that these components can even be co-emulsified or that a co-emulsion of these components can form a functioning thermal transfer layer: the *broad generic teachings* of Lorenz et al. encompass coating formulations wherein both the crosslinker and the thermoplastic resin are *soluble* in the solvent and not *emulsified.*

3) Lorenz et al. do not provide any teaching for one of skill in the art to make a co-emulsion or co-dispersion of curing agent, and emulsions for two components do not inherently describe a *co-emulsion* of these components.

Regarding arguments 1 and 2, Lorenz et al. disclose, "The coating formulations of this invention can contain the above identified solids in an *aqueous or organic*: solution, dispersion or emulsion," (column 7, lines 62-64) wherein these solids include:

a) wax as a main dry component (column 5, line 49 through column 6, line 70);

b) a binder resin, preferably a reactive epoxy resin together with a crosslinker (column 6, line 8 through column 7, line 21);

c) other solids (column 7, lines 22-45);

d) plasticizers (column 7, lines 46-55); and

e) other conventional additives (column 7, lines 56-61).

Lorenz et al. do not specifically use the terminology *co-emulsified*; however, these components are collectively present in an emulsion. It is assumed that for an aqueous formulation to exist as and to be considered an emulsion, the solids in this emulsion are homogeneous and non-soluble. Lorenz et al. even add, "The binder resin (see component b, above) is preferably *compatible* with the wax such that it does not separate out in aqueous dispersions or emulsions," (column 7, lines 13-16). In other words, the binder resin and the wax are homogeneous and non-soluble in aqueous dispersions or emulsions. Because the crosslinker is considered part of the binder resin component, it is assumed that the crosslinker exhibits "compatibility" in order to maintain the emulsified state of the formulation.

Therefore, Lorenz et al. do establish that formulation can exist as an aqueous dispersion or emulsion. As a result, Lorenz et al. also teach and/or suggest that these components can form a functioning thermal transfer layer.

Regarding argument No. 3, Applicant does not clearly define the co-emulsification process; however, it is assumed that "co-emulsification" refers to a process wherein two solids are added and emulsified in a liquid medium at the same time. Lorenz et al. do not explicitly disclose this type of process; rather, they simply refer to an emulsion. The Examiner agrees with the Applicants' statement that, "an emulsion of the two solids can be prepared by combining a separate emulsion of epoxy curing agent and a separate emulsion of thermoplastic resin and/or wax;" however, the claims in question are composition claims. The compositions are essentially products, and their patentability is based on the materials within – not the manner in which they were prepared.

It has been found that, "Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process" *In re Thorpe*, 777 F. 2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). Since the composition of Lorenz et al. meets all of the material requirements of the claimed invention, it would have anticipated or would have been an obvious variation of the claimed composition.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Communication

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J Feely whose telephone number is 571-272-1086. The examiner can normally be reached on M-F 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Michael J. Feely
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PHILIP TUCKER
PRIMARY EXAMINER
ART UNIT 1712

February 8, 2004